Listing of Claims

1. (currently amended) An apparatus for monitoring an operation of a fluid dispensing gun dispensing a pattern of fluid onto a substrate moving with respect to the dispensing gun, the dispensing gun changing operating states in response to ~~transition~~ reference signals, and a sensor disposed adjacent the substrate for providing feedback signals in response to detecting edges of fluid on the substrate, the apparatus comprising:

a trigger sensor providing a transition signal representing a detected characteristic of the substrate moving with respect to the dispensing gun;

an input signal processor responsive to the transition signal, the reference signals and the feedback signals, said input signal processor periodically

sampling a reference signal and providing a first representation of an edge of the reference signal,

sampling a feedback signal and providing a second representation of a corresponding edge of fluid dispensed on the substrate resulting from an edge of the reference signal, and

storing the first and the second representations;

signal correlator means responsive to the first and the second representations for correlating the second representation to the first representation; and

an output processor responsive to said signal correlator means for extracting a delay between the edge of the reference signal and the corresponding edge of the fluid dispensed on the substrate resulting from an edge of the reference signal

~~a diagnostic monitor responsive to the transition signals and the feedback signals for automatically measuring delays between detecting~~

~~occurrences of the transition signals and detecting corresponding edges of fluid on the substrate resulting from the transition signals~~.

Claims 2-5 (canceled)

6. (currently amended) An apparatus for monitoring an operation of a fluid dispensing gun dispensing a pattern of fluid onto a substrate moving with respect to the dispensing gun, the dispensing gun changing operating states in response to ~~transition~~ reference signals, the apparatus comprising:

a first sensor disposed adjacent the substrate for providing feedback signals in response to detecting edges of fluid on the substrate; ~~and~~

a trigger sensor providing a transition signal representing a detected characteristic of the substrate moving with respect to the dispensing gun;

an input signal processor responsive to the transition signal, the reference signals and the feedback signals, said input signal processor periodically

sampling a reference signal and providing a first representation of an edge of the reference signal,

sampling a feedback signal and providing a second representation of a corresponding edge of fluid dispensed on the substrate resulting from an edge of the reference signal, and

storing the first and the second representations;

signal correlator means responsive to the first and the second representations for correlating the second representation to the first representation; and

an output processor responsive to said signal correlator means for extracting a delay between the edge of the reference signal and the corr sponding edge of the fluid dispensed on the substrate resulting from an edge of the reference signal

~~a diagnostic monitor responsive to the transition signals and said feedback signals for automatically measuring delays between detecting occurrences of the transition signals and detecting corresponding edges of fluid on the substrate resulting from the transition signals~~.

7. (currently amended) An apparatus for monitoring an operation of a dispensing gun dispensing a pattern of adhesive onto a substrate moving with respect to the dispensing gun, the apparatus comprising:

a pattern controller providing ~~transition~~ reference signals representing changes of state of operation of the dispensing gun;

a gun driver operatively connected to the ~~fluid~~ dispensing gun and changing operating states of the dispensing gun in response to said ~~transition~~ reference signals;

a first sensor disposed adjacent the substrate, said first sensor providing feedback signals in response to detecting edges of adhesive on the substrate; ~~and~~

a trigger sensor providing a transition signal representing a detected characteristic of the substrate moving with respect to the dispensing gun;

an input signal processor responsive to the transition signal, the reference signals and the feedback signals, said input signal processor periodically

sampling a reference signal and providing a first representation of an edge of the reference signal,

sampling a feedback signal and providing a second representation of a corresponding edge of fluid dispensed on the substrate resulting from an edge of the reference signal, and

storing the first and the second representations;

signal correlator means responsive to the first and the second representations for correlating the second representation to the first representation; and

an output processor responsive to said signal correlator means for extracting a delay between the edge of the reference signal and the corresponding edge of the fluid dispensed on the substrate resulting from an edge of the reference signal

~~a diagnostic monitor electrically connected to said sensor and responsive to said transition signals, said diagnostic monitor automatically determining delays between transition signals and corresponding edges of the adhesive on the substrate resulting from said transition signals~~.

8. (currently amended) An apparatus for monitoring an operation of a dispensing gun dispensing a pattern of adhesive onto a substrate moving with respect to the dispensing gun, the apparatus comprising:

a pattern controller providing first ~~transition~~ reference signals representing changes of state of operation of the dispensing gun;

a gun driver providing second ~~transition~~ reference signals to the ~~fluid~~ dispensing gun in response to said first ~~transition~~ reference signals, said second ~~transition~~ reference signals causing the dispensing gun to change operating states;

a first sensor disposed adjacent the substrate, said first sensor providing feedback signals in response to detecting edges of adhesive on the substrate; ~~and~~

a trigger sensor providing a transition signal representing a detected characteristic of the substrate moving with respect to the dispensing gun;

an input signal processor responsive to the transition signal, the second reference signals and the feedback signals, said input signal processor periodically

sampling a second reference signal and providing a first representation of an edge of the reference signal,

sampling a feedback signal and providing a second representation of a corresponding edge of fluid dispensed on the substrate resulting from an edge of the second reference signal, and

storing the first and the second representations;

signal correlator means responsive to the first and the second representations for correlating the second representation to the first representation; and

an output processor responsive to said signal correlator means for extracting a delay between the edge of the second reference signal and the corresponding edge of the fluid dispensed on the substrate resulting from an edge of the second reference signal

~~a diagnostic monitor electrically connected to said sensor and responsive to one of said first and said second transition signals, said diagnostic monitor automatically determining delays between said one of said first and said second transition signals and corresponding edges of the adhesive on the substrate resulting from said one of said first and said second transition signals~~.

9. (currently amended) An apparatus for monitoring an operation of a dispensing gun dispensing a pattern of adhesive onto a substrate moving with respect to the dispensing gun, the apparatus comprising:

a pattern controller providing gun ON and OFF signals representing times at which the dispensing gun should open and close, respectively;

a gun driver operatively connected to the dispensing gun and opening and closing the dispensing gun in r sponse to said gun ON and OFF signals, respectively;

a first sensor disposed adjacent the substrate, said first sensor providing feedback signals in response to detecting edges of the adhesive on the substrate;

a trigger sensor providing a transition signal representing a detected characteristic of the substrate moving with respect to the dispensing gun;

an input signal processor responsive to the transition signal, the ON and OFF signals and the feedback signals, said input signal processor periodically

sampling an ON and OFF signal and providing a first representation of an edge of the reference signal,

sampling a feedback signal and providing a second representation of a corresponding edge of fluid dispensed on the substrate resulting from an edge of the ON and OFF signal, and

storing the first and the second representations;

signal correlator means responsive to the first and the second representations for correlating the second representation to the first representation; and

an output processor responsive to said signal correlator means for extracting a delay between the edge of the ON and OFF signal and the corresponding edge of the fluid dispensed on the substrate resulting from an edge of the reference signal occurring

~~a diagnostic monitor electrically connected to said sensor and responsive to said gun ON and OFF signals, said diagnostic monitor automatically determining delays between said gun ON and OFF signals and corresponding edges of the adhesive on the substrate resulting from gun ON and OFF signals.~~

Claims 10-24 (canceled)